PROGRAM SCHEDULE 2004

SPRING 2004
29 MAR 2004 to 02 JUN 2004
SUMMER 2004
28 JUN 2004 to 31 AUG 2004
FALL 2004
04 OCT 2004 to 14 DEC 2004

COURSE SCHEDULE

WEEKS 1-3: OENG 530/536 - IR Fundamentals
WEEKS 4-5: OENG 531/537 - ONIR
WEEKS 6-7: OENG 533/539 - MSI/HSI
WEEKS 8-9: EENG 532/538 - SAR
  WEEK 10: Exit Exam - Capstone Seminar

Courses may be taken over multiple sessions; OENG 530 is a prerequisite for all of the other courses.

The first week of the MCP is a Mathematics and Physics Review with an orientation seminar in the applications of MASINT. The last week is devoted to program evaluation, a comprehensive exit examination and capstone seminar. The four academic courses are offered sequentially to present a coherent development of the science and applications of MASINT IR/SAR.

WEEKLY SCHEDULE

	MON	TUE	WED	THUR	FRI
8	CLASS	CLASS	CLASS	CLASS	CLASS
9	CLASS	CLASS	CLASS	CLASS	CLASS
10	CLASS	CLASS	CLASS	CLASS	CLASS
11					CLASS
12					
13	SEMINAR	LAB	LAB	LAB	
14		LAB	LAB	LAB	
15		LAB	LAB	LAB	
16		LAB	LAB	LAB	

ENROLLMENT INFORMATION

Send the following materials to Program Coordinator at the address below NLT 3 weeks prior to session start.
• AFIT FORM 2 and MCP ENROLLMENT FORM
  (http://en.afit.edu/cmsr/mcp.html)
• TRANSCRIPTS
• CLEARANCES (collateral SECRET)

LODGING
Rooms are reserved at WPAFB Billeting. Confirm with Program Coordinator NLT 3 weeks prior to session start.

TRANSPORTATION
Students are responsible for providing their own transportation. Classes are held at AFIT; Billeting is approximately 5 miles from AFIT; Lab is approximately 3 miles from AFIT.

For additional information on enrollment, please visit the MCP website at:
(http://en.afit.edu/cmsr/mcp.html)

POINT OF CONTACT

PROGRAM COORDINATOR
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**Air Force Institute of Technology
Wright-Patterson AFB OH**

CENTER FOR masint
MEASUREMENT & SIGNATURE INTELLIGENCE
STUDIES & RESEARCH

CERTIFICATE PROGRAM

http://en.afit.edu/cmsr/mcp.html

COURSE DESCRIPTIONS

OENG 530: FUNDAMENTALS OF IR AND MASINT PHENOMENOLOGY (3 credits)

Provides the groundwork for solving MASINT remote sensing problems, with emphasis on IR technology. Considers both the signature and metric aspects of MASINT. Topics include source characterization, radiometry, propagation and attenuation, collection optics, detectors and elementary data stream processing.

OENG 531: OVERHEAD NON-IMAGING IR MASINT COLLECTION SYSTEMS (3 credits)

Applies the principles developed in the first course to explore available technology for collecting, processing and exploiting ONIR data for missile warning, missile defense, support for military operations, battlespace characterization and technical intelligence using National Technical Sensors. Prerequisite: OENG 530

OENG 533: MULTISPECTRAL/HYPER-SPECTRAL MASINT EXPLOITATION (3 credits)

Examines information that can be extracted from multispectral and hyperspectral data sets collected by MASINT sensors. Introduces basic sensor/platform concepts and performance metrics for collecting spectral data. Surveys existing spectral sensor and/or platform combinations for various applications and the corresponding algorithms for data exploitation. Prerequisite: OENG 530

EENG 532: INTRODUCTION TO RADAR AND SYNTHETIC APERTURE SYSTEMS (3 credits)

Provides the basis for understanding radar systems, including range-azimuth, Doppler, synthetic aperture, phased-array, bistatic, and over-the-horizon radars. Emphasizes application of MASINT phenomenology with signature exploitation of radar cross-sections and wideband signal interpretation. Examples may be drawn from the National Technical Sensors. Prerequisite: OENG 530

OENG 536, OENG 537, OENG 539, EENG 538: MASINT IR/SAR DATA PROCESSING LABS (4x1 credit)

Investigates MASINT data, phenomenology and processing algorithms using problem solving and hands-on practical sessions. Exercises complement the academic courses with demonstrations and applications of software to process non-imaging focal plane array, multi/hyperspectral image cube and synthetic aperture radar data. Problems may include use of Excel®, MODTRAN, PLEXUS, NOAS, Matlab®, Satellite Tool Kit (STK®), COSMEC, ENVI®, Case Executive®, and other IR, MS/HS and SAR workbench tools.

AFIT extends their appreciation to AFRL/SNAS and NAIC/DEM for providing laboratory tools and support.

OENG 535: MASINT FOR THE WARFIGHTER SEMINAR (1 credit)

Sessions present MASINT topics of interest to the military and intelligence communities, and exploit the knowledge and experience of seasoned users and practitioners of MASINT IR/SAR data products. Credit given upon completion of all weekly seminars.

MATHEMATICS AND PHYSICS REVIEW (no credit)

Reviews skills in basic mathematics that support MASINT problem solving. Introduces fundamental issues in physics, chemistry, engineering and technology.

FACULTY

Dr. Ron Tuttle
Chair for MASINT Studies and Research, AFIT
Professor Howard Evans
Professor Kelce Wilson
Professor James Lange

The Air Force Institute of Technology (AFIT) is the Air Force's premier institution of graduate and professional continuing education to keep the Air Force and DoD on the leading edge of technology and management. AFIT is a Partner Institution of the Dayton Area Graduate Studies Institute (DAGSI).

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masint
MEASUREMENT & SIGNATURE INTELLIGENCE
CERTIFICATE PROGRAM

The MASINT IR/SAR Certificate Program (MCP) is a ten-week educational series in the technical aspects of collecting, processing and exploiting non-literal, remotely-sensed infrared (IR) and synthetic aperture radar (SAR) intelligence data. The MCP provides the scientific basis underlying MASINT technology, introduces students to the capabilities of current MASINT collection systems and exploitation tools, and highlights the unique contributions that MASINT provides to intelligence production. The MCP is intended for MASINT analysts, algorithm developers, system instructors and training program developers. It will also benefit MASINT data product users and collection managers; those working in missile warning, missile defense, battlespace characterization, technical intelligence and homeland defense; and those working in planning, programming and force modernization programs. The MCP consists of four 3-credit academic courses focused on the technical basis of MASINT IR/SAR, four companion 1-credit labs introducing data processing software and methods, and a 1-credit seminar.

MCP attendees having bachelor's degrees may be eligible for graduate credit, and non-degreed attendees may be eligible for undergraduate credit. Students successfully completing the four courses, four labs, seminar and exit exam (17 quarter credit hours) will receive a Certificate in MASINT IR/SAR. Attendees are nominated to the MCP by their military services or government agencies. Students should have a degree in physics or engineering, *or* a strong background in basic physics and mathematics, *or* significant practical experience in MASINT. A US Government security clearance is required (collateral SECRET), and students must be US citizens. Tuition, fees, transportation and TDY costs are the responsibility of sponsoring organizations.